

OK to enter
WH 5/11/04

1

DEVICE FOR AND METHOD OF DETECTING RESIDUAL CURRENT WITH RESISTIVE SHUNTS

BACKGROUND OF THE INVENTION

This invention relates to a residual current detection device for use in a circuit breaker.

DESCRIPTION OF THE PRIOR ART

Conventionally, residual current is detected utilizing a current transformer having primary windings through which, in the case of a single phase device, load current flows in opposite directions so that if the return current is different from the outwardly flowing current because of current leakage an output current signal is induced in a secondary winding of the transformer. In the case of a multi-phase device, primary windings of the transformer are connected in all of the phase lines and the neutral line. In normal situations, when there is no current leakage, the net current induced in the secondary winding is zero and therefore no output is detected.

Sophisticated materials have been developed for the core of the current transformer, which enable considerable accuracy to be obtained when the currents flowing in the primary windings are substantially sinusoidal. However, switch mode power supplies are often used for computers and other equipment and there is an increasing tendency for such equipment to cause dc offsets in the currents. Such developments have made detectors utilizing current transformers less reliable and prone to false tripping or failure to detect a dc current leakage.

This is a particular problem in the case of directly actuated electro-mechanical devices, where the current transformer secondary winding actually drives an actuator. The situation is not much improved, when including an electronic detection and amplification means connected to the secondary winding, as there are still problems with high frequency transients and dc offsets. A very small dc current level can cause the core to saturate thereby seriously impairing the ability of the detector to detect current leakage.